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Alex M.S. George
Portland State University

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The Effects of the ACA on Actuarial Pricing: How the Work of Health Actuaries Has Changed Post-ACA

by

Alex M.S. George

An undergraduate honors thesis submitted in partial fulfillment of the

requirements for the degree of

Bachelor of Science

in

University Honors

and

Mathematics

Thesis Adviser

Robert L. Fountain, Ph.D.

Portland State University

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Research Questions:

What are the key provisions of the Patient Protection and Affordable Care Act (PPACA) that have impacted the pricing considerations of health actuaries and the consumers of healthcare in the individual and small group markets in the United States? Can the effects of the age and tobacco related rating restrictions be quantified?

Introduction

In the United States, the Patient Protection and Affordable Care Act (PPACA or ACA) drastically altered the health insurance industry. Insurers are no longer able to deny coverage or charge higher premiums based on an individual's medical history. In order to "more evenly spread the financial risk borne by issuers and help stabilize premiums," risk-sharing provisions dubbed the "3 R's" (risk adjustment, risk corridors, and reinsurance) were instituted in the individual and small group market ("Summary Report on Transitional Reinsurance Payments and Permanent Risk Adjustment Transfers for the 2014 Benefit Year"). With these recent events in mind, there are two objectives for this research exercise. Firstly, there will be a discussion of the various changes brought about by the ACA that impact the considerations of actuaries pricing individual and small group medical insurance and the consumers of healthcare in the United States. After having established the implications of these recent changes, health insurance premium data from the Washington Office of the Insurance Commissioner will be used to analyze the effects of specific health insurance rating restrictions implemented by the ACA.

In order to comprehend the Affordable Care Act's relevance to actuaries, it is critical to first understand the role of actuaries in the health insurance industry.

Actuaries are sometimes described as financial engineers responsible for assessing risk and ensuring the financial security of their organization. Their work includes, but is not limited to analyzing data, setting reserves, developing predictive models, and forecasting future claims and premiums. These tasks are impacted by risk adjustment, reinsurance, and risk corridors along with many other provisions and changes made by the Affordable Care Act. As such, it is paramount that they understand what changes have been made and how they alter traditional actuarial methods and strategies. The finer details of these changes will be discussed in great detail in the following analysis, but for the purposes of this introduction, I will provide a list of the various topics for the research exercise. They are as follows: guaranteed issue, family 3-child cap for individual market rating, the health insurance marketplace, actuarial value, essential health benefits, age bands and tobacco usage, reinsurance, risk adjustment, and risk corridors. After having addressed these topics, I will be conducting a statistical analysis to provide quantitative evidence of how actuaries have been affected by the aforementioned rating restrictions including age bands and tobacco usage related restrictions.

Significant Changes Impacting Healthcare Providers

Introduction

Prior to the implementation of the ACA, insurers and their actuaries had significantly more freedom in how they priced their medical insurance. In theory, premiums were based primarily on the expected costs associated with the risks of their enrollees. However, with the advent of certain legislation including age bands, tobacco-usage related pricing restrictions, risk adjustment, etc., actuaries are not only more

limited in how they can price their insurance, but are additionally required to consider more closely the decisions being made by their competitors in the market. The following pages will seek to shed light on these topics and others to highlight how both actuaries and consumers of healthcare have been affected by these changes.

Guaranteed Issue

Guaranteed issue is likely the most tangible change for health insurance consumers in the individual market brought about by the Affordable Care Act. As of 2014, the ACA prevents the denial of medical insurance coverage to an individual because of a preexisting condition. In the past, medical insurance providers could refuse coverage to individuals with preexisting conditions. Insurers could also elect to extend coverage to these individuals with the caveat of charging a higher premium. The practice of using medical or health information to assess an applicant's eligibility for medical insurance is known as medical underwriting. Under the ACA, this practice has been eliminated in the individual marketplace. This means that insurers must offer coverage to individuals (and families) regardless of their current medical state. Additionally, individuals with conditions ranging from back pain to cancer cannot be charged a higher premium based on their medical history ("Marketplace Health Plans Cover Pre-Existing Conditions").

The Children's Health Insurance Program (CHIP) and Medicaid are also unable to refuse coverage or charge more because of an individual's medical history. One exception to guaranteed issue exists in regards to grandfathered individual health plans. Note that grandfathered plans are plans that existed prior to March 24, 2010 and have not had changes that reduced benefits substantially or increased costs for consumers.

These plans are not required to cover preexisting conditions. If an individual is facing the situation in which their insurer does not cover a preexisting condition, then they may be inclined to switch insurance providers, and can elect to purchase a different health insurance plan through a health insurance marketplace (also known as a health exchange) (“Marketplace Health Plans Cover Pre-Existing Conditions”). The health insurance marketplace will be discussed further below.

Family 3-Child Cap for Individual Market Rating

Another change brought about by the ACA that clearly impacts health insurance consumers is the implementation of a 3-child cap for individual market rating. The official Centers for Medicare and Medicaid Services (CMS) technical summary imposes “a cap of no more than three covered children under the age of 21 whose per member rates are taken into account in determining the family premium” (“Overview: Final Rule for Health Insurance Market Reforms”). What this means in practice is that the premium for a family with more than three children under the age of 21 will only be based on the price of insurance for three of the children under 21. For example, assume there were two families with the same insurance coverage composed of identical age and gender configurations and three children under the age of 21. Then assume one of the families were to have a fourth child. Under this ACA ruling, the insurance premiums for the two families would remain identical even after one family’s addition of the fourth child.

The Health Insurance Marketplace

The health insurance marketplace (also known as the health exchange) was created with the intent to be “a resource where individuals, families, and small businesses can: learn about their health coverage options; compare health insurance

plans based on costs, benefits, and other important features; choose a plan; and enroll in coverage" ("Health Insurance Marketplace"). The health insurance marketplace is also the means by which individuals can apply for coverage through the Children's Health Insurance Program (CHIP) and Medicaid or apply for government subsidies for their health insurance. Private insurers are permitted to sell health insurance plans on the exchange as well, but in order to do so, the plans must meet certain requirements. These requirements additionally apply to all private plans, including individual, small group, large group, and self-insured plans in which employers contract administrative services to a third party payer. The only exception is in the case of grandfathered plans, which are not bound by these requirements ("Preventive Services Covered by Private Health Plans under the Affordable Care Act").

Among these requirements is a set of preventive services that must be covered without charging a copayment or coinsurance. This list is long and varied, but examples include mammograms, blood pressure screening, diet counseling, immunizations, and vision screening for children ("Preventive Services Covered by Private Health Plans under the Affordable Care Act"). Marketplace plans also have restrictions in regard to maximum out-of-pocket costs. For 2014 the maximum out-of-pocket costs for an individual plan and family plan were $6,350 and $12,700 respectively (Andrews). For 2015 the maximum out-of-pocket costs for an individual plan and family plan were $6,600 and $13,200 ("Out-of-Pocket Maximum/limit"). Money paid in deductibles, coinsurance, and copays all contribute to these limits, and once the limit has been reached, the insurance company is responsible for 100% of the costs for covered care.

These changes should benefit individuals purchasing non-grandfathered plans by guaranteeing preventive benefits and limiting their out-of-pocket costs.

Actuarial Value

Actuarial value is defined as a measure of the "relative generosity" of the benefits covered by a given health insurance plan. The actuarial value indicates the "average share of medical spending that is paid by the plan, as opposed to being paid out-of-pocket by the consumer." This value is given as a percentage, and takes into account the plan's cost-sharing features including copyaments, out-of-pocket maximums, deductibles, and coinsurance. These actuarial values can be used to categorize plans into different "metal" tiers. Bronze, silver, gold, and platinum plans have actuarial values of 60%, 70%, 80%, and 90% respectively. The government provides insurers a calculator which can be used to determine the actuarial value of their plans. For those enrolling in health insurance plans, it is critical to again note that the actuarial values or metal tiers are intended to calculate the "average share of medical spending" paid by the plan, and the true percentage can and will vary for plans within the same metal tier (American Academy of Actuaries).

Essential Health Benefits

The concept of essential health benefits (abbreviated EHBs) was also introduced to the health insurance industry through the Affordable Care Act. The ACA requires non-grandfathered health plans to cover items and services from the following ten benefit categories: "(1) ambulatory patient services, (2) emergency services, (3) hospitalization, (4) maternity and newborn care, (5) mental health and substance use disorder services including health and behavioral health treatment, (6) prescription

drugs, (7) rehabilitative and habilitative services and devices, (8) laboratory services, (9) preventive and wellness services and chronic disease management, and (10) pediatric services including oral and vision care." These EHBs are to be "equal in scope to a typical employer health plan." EHBs are defined by state specific EHB-benchmark plans ("Information on Essential Health Benefits (EHB) Benchmark Plans"). Note that this allows for situations in which the essential health benefits are defined differently from one state to the next.

Age Bands and Tobacco Usage

One unquestionably notable reform under the ACA relates to the implementation of "age bands." Providers are now limited to a 3:1 ratio between the premiums paid for the most elderly members and the youngest adult members. Children have a single age band spanning from 0 to 20 years of age. Adults have one-year age bands beginning at age 21 and ending at age 63. There is also one final age band for all individuals 64 and older. States were permitted to use a narrower age curve if they submitted relevant information to the government by March 29, 2013. Otherwise they would be required to use the age curve seen below ("Summary Report on Transitional Reinsurance Payments and Permanent Risk Adjustment").

Table 1

Age Bands

Age	Premium Ratio	Age	Premium Ratio	Age	Premium Ratio
0-20	0.635	35	1.222	50	1.786
21	1.000	36	1.230	51	1.865
22	1.000	37	1.238	52	1.952
23	1.000	38	1.246	53	2.040
24	1.000	39	1.262	54	2.135
25	1.004	40	1.278	55	2.230
26	1.024	41	1.302	56	2.333
27	1.048	42	1.325	57	2.437
28	1.087	43	1.357	58	2.548
29	1.119	44	1.397	59	2.603
30	1.135	45	1.444	60	2.714
31	1.159	46	1.500	61	2.810
32	1.183	47	1.563	62	2.873
33	1.198	48	1.635	63	2.952
34	1.214	49	1.706	64 and Older	3.000

Source: Centers for Medicare and Medicaid Services. “Summary Report on Transitional Reinsurance Payments and Permanent Risk Adjustment Transfers for the 2014 Benefit Year.” 30 June 2015. Web. 11 Jan. 2016.

In tandem with the above table, rates for tobacco users are allowed to vary no more than 1.5:1 for any one age group. For example, a tobacco using individual 64 years and older may only be charged up to 4.5 times more than a 21 year-old who does not use tobacco. Tobacco use is defined as “the use of a tobacco product or products four or more times per week within no longer than the past 6 months by legal users of tobacco products and includes all tobacco products.” States and issuers are also permitted to implement a stricter tobacco rating factor within 1:1 and 1.5:1 should they choose to do so (“Overview: Final Rule for Health Insurance Market Reforms”).

Introduction to the 3 R's

As a result of the above changes, the Affordable Care Act included three provisions collectively referred to as premium stabilization programs, which are more commonly known as the "3 R's." The "3 R's" refer to reinsurance, risk adjustment, and risk corridors. The ultimate goal of these premium stabilization programs is to support the ACA's mission to provide consumers with affordable health insurance coverage by reducing incentives for health insurers to avoid enrolling sicker people and stabilizing premiums in the individual and small group health insurance markets ("Premium Stabilization Programs"). Reinsurance, risk corridors, and risk adjustment will be discussed further in the following paragraphs.

Reinsurance

The concept of reinsurance is not new in the health insurance industry. Reinsurance is a type of an insurance offered to insurers as a means of mitigating large losses. The "Transitional Reinsurance Program" was implemented by the ACA to "stabilize premiums in the individual market inside and outside of the Marketplace" ("The Transitional Reinsurance Program - Reinsurance Contributions"). Note that reinsurance payments are only made for claims on members in non-grandfathered individual plans. Since an individual can no longer be denied coverage because of a preexisting condition, insurance companies face higher risk pools than in the past, and reinsurance can dampen the effects of larger claims. The concept is that this "transitional" (meaning temporary) program works to stabilize premiums by dissuading insurers from inflating premiums to protect themselves from the new risk pool. The intent is that by 2017

(when the reinsurance program ends), insurers should have better data to use when pricing their products.

For the 2014 benefit year, the original attachment point, reinsurance cap, and coinsurance rate were $60,000, $250,000, and 80% respectively. The attachment point and coinsurance rate were later changed to $45,000 and 100% respectively ("Summary Report on Transitional Reinsurance Payments and Permanent Risk Adjustment Transfers for the 2014 Benefit Year"). The original attachment point for 2015 was $70,000, but it was later changed to $45,000. The reinsurance cap for 2015 was $250,000 with a coinsurance rate of 50% (as of 6/18/15). The proposed 2016 reinsurance attachment point and reinsurance cap are $90,000 and $250,000 respectively with a coinsurance rate of 50% (Perlman, Norris, Leida). As in years past, if reinsurance contributions exceed reinsurance payments, the coinsurance may be changed to ensure that the contributions collected are expended (Cigna). The table (Table 2) and formula below illustrate how the reinsurance payment is calculated where x is the sum of an individual's claims for the year, A is the attachment point, B is the reinsurance cap, C is the coinsurance rate as a percentage, and $f(x)$ equals the reinsurance payment to the insurer for the given individual.

Table 2

Reinsurance Parameters

Year	Attachment Point	Reinsurance Cap	Coinsurance	Fee
2014	$45,000	$250,000	100%	$63
2015	$45,000	$250,000	50%	$44
2016	$90,000	$250,000	50%	$27

Source: Perlman, Daniel, Doug Norris, and Hans Leida. “Transitional Reinsurance at 100% Coinsurance: What It Means for 2014 and beyond.” *Milliman*. 24 June 2015. Web. 11 Jan. 2016.

Reinsurance Payment Calculation:

$$f(x) = \begin{cases} 0, & x \leq A \\ (x - A) * C, & A < x \leq B \\ (B - A) * C, & x > B \end{cases}$$

A sample reinsurance calculation for 2015 is provided below with the following assumptions:

- Total claims for an individual in a given year = $150,000
- Attachment point = $45,000
- Reinsurance cap = $250,000
- Coinsurance rate = 50%

$f(\$150{,}000) = [(\$150{,}000 - \$45{,}000) * .50] = \$52{,}500$

In order to fund the transitional reinsurance program, $63 will be collected per member per year in 2014 from “health insurance issuers and certain self-insured group health plans offering major medical coverage that is part of a commercial book of

business.” Also note that for the purpose of reinsurance contributions, major medical coverage is defined as “a catastrophic plan, an individual or a small group market plan subject to the actuarial value requirements under 45 CFR (Code of Federal Regulations) 156.140, or health coverage for a broad range of services and treatments provided in various settings that provides minimum value as defined in 45 CFR 156.145” (“The Transitional Reinsurance Program - Reinsurance Contributions”). This means that while reinsurance payments are only made to claims in the individual market, contributions will come from major medical plans from the individual, small group, and large group markets and self-funded group major medical plans. A full breakdown of businesses required and not required to fund the federal reinsurance program is represented in Table 3 below (Cigna).

Table 3

Reinsurance Contributions

Reinsurance Fee
Business affected
· Insured individual and group major medical plans · Self-funded group major medical plans · Taft-Hartley Plans to the extent the plans meet other criteria for inclusion · Group retiree medical plans covering individuals who are not eligible for Medicare or for whom Medicare is the secondary player o (includes active employees age 65+ and pre-65 retirees) · Medical Plans that are integrated with a Health Reimbursement Account (HRA) · Short-Term Abroad (STA) expatriate plans · Self-funded expatriate plans (in 2014 only)
Business excluded
· Standalone pharmacy and behavioral health plans · Standalone dental and vision plans · Hospital indemnity and specified disease plans · Private Medicare, Medicaid, CHIP, state and federal high-risk pools and basic health plans · Coverage for post-65 retirees and disabled individuals where Medicare is the primary payer · Health Savings Accounts (HSAs) · Flexible Spending Accounts (FSAs) · Employee Assistance Plans (EAPs), disease management programs and wellness programs · Stop-loss and indemnity reinsurance policies · Military health benefits · Indian Health Service Coverage · Insured expatriate coverage · Self-funded expatriate plans (in 2015 and 2016)

Source: Cigna. “Reinsurance Fact Sheet.” (2015): Web. 11 Jan. 2016.

Risk Adjustment

Risk adjustment is likely to be the most significant topic of discussion for actuaries working in the post-ACA marketplace. Unlike reinsurance and risk corridors, risk adjustment will persist indefinitely beyond 2016. The concept of risk adjustment is fairly simple, but the implementation of this risk-sharing mechanism is complicated. Essentially risk adjustment “redistributes funds from plans with lower-risk enrollees to

plans with higher-risk enrollees" for non-grandfathered plans in the individual and small group markets ("Explaining Health Care Reform: Risk Adjustment, Reinsurance, and Risk Corridors"). The intent is to have plans that are priced based on the market average risk, as opposed the risk of their prospective enrollees. This proposition becomes challenging when examining the means by which the risk adjustment transfer payments are calculated. Below is the risk adjustment transfer formula which "averages all individual risk scores in a risk adjustment covered plan, makes certain adjustments, and calculates the funds transferred between plans" (Kautter). The details of these certain adjustments and their implications are discussed in the following paragraphs.

$$T_i = \left[\frac{PLRS_i \cdot IDF_i \cdot GCF_i}{\sum_i \left(s_i \cdot PLRS_i \cdot IDF_i \cdot GCF_i \right)} - \frac{AV_i \cdot ARF_i \cdot IDF_i \cdot GCF_i}{\sum_i \left(s_i \cdot AV_i \cdot ARF_i \cdot IDF_i \cdot GCF_i \right)} \right] \overline{P}_s$$

ARF_i: Allowable rating factor
AV_i: Actuarial value of plan i's metal level
GCF_i: Geographic cost factor
IDF_i: Induced demand factor
$PLRS_i$: Plan liability risk score
$\overline{P}_s$: statewide market average plan premium
s_i: plan's share of marketwide enrollment
T_i: Transfer amount

In order to better understand the formula, it is critical to begin with the CMS's given definitions of the variables used. The plan liability risk score reflects "a plan's actuarial value as well as the plan's enrollee health status risk (including health risk due to age)," and is calculated using the CMS-HCC model. This will be discussed further in the next section. The induced demand factor reflects "the anticipated induced demand

associated with the plan's (metal) level." Put another way, an insurer would expect that with richer benefits, they would see higher utilization of these benefits. For example, if one plan had comparably cheaper copayments versus another, one might expect the enrollee to use the benefits more often. Therefore, this induced demand factor might be greater for a gold plan than a bronze plan. The geographic cost factor "reflects the medical cost structure in the geographic location of the plan's enrollees." The allowable rating factor "reflects the impact of the age composition of each plan's enrollees on the premiums it would collect from enrollees." Actuarial value was defined previously as a means of measuring benefit richness represented as a percentage of the "average share of medical spending" paid by the plan (Pope et al.). The remaining variables (statewide market average plan premium, plan's share of marketwide enrollment, and transfer amount) are self-explanatory.

For the purposes of this analysis, the focus will be specifically on interpreting the intent of this formula and how it practically alters traditional actuarial pricing considerations. Firstly, there exists significant unknowns in the above formula: $\sum_i PLRS_i$ and s_i. The first unknown ($\sum_i PLRS_i$) represents the sum of the marketwide plan liability risk scores, and the second unknown (s_i) represents the plan's share of marketwide enrollment. While an actuary may be able to estimate their own company's plan liability risk score using the HHS-HCC risk adjustment model, it will be significantly more challenging for them to estimate the plan liability risks scores of their competitors. Milliman actuaries Mary van der Heijde and Jordan Paulus state that, "It is difficult – if not impossible—to estimate risk transfer payments based on a carrier's risk score

alone" (Van der Heijde, Paulus). Similarly, a plan's market share changes from year to year and is also impacted by the other plans offered by the insurer and its competitors.

The goals of the risk adjustment program as described by the CMS were to provide "payments to health insurance issuers that attract high-risk enrollees, such as those with chronic conditions," reduce "the incentives for issuers to avoid those enrollees," and lessen "the potential influence of risk selection on the premiums that plans charge" ("Summary Report on Transitional Reinsurance Payments and Permanent Risk Adjustment Transfers for the 2014 Benefit Year"). As a result, actuaries have to seriously consider how their enrollees compare with the rest of the market and how their insurer's plan designs and corresponding premiums may impact the composition of their enrollees. For example, assume that in the state of Washington a particular insurer offered the cheapest gold plan in the individual market. As a result, they may gain a large share of business from individuals looking for budget gold tier plans, but this demographic may be different than that of another more expensive gold tier plan offered by another insurer. As a result, the plan liability risk score for this cheaper gold plan would vary from other gold plans in the market.

Consider another situation where an insurer focuses its marketing heavily on young healthy adults. In the past, this was more common practice as insurers benefitted heavily from having healthier enrollees. Now in the post-ACA market insurers have to consider whether having a higher proportion of healthier individuals is actually financially beneficial, as they may forfeit profits if their plan liability risk scores are significantly lower than the market average. The ultimate intent here is to display how this implementation of risk adjustment has dramatically altered the mindset of traditional

actuarial practices. No longer can actuaries focus primarily on planning for the risk profile of their typical demographic of enrollees. They must also direct their gaze towards the rest of the market and ensure that their plans and pricing do not place them in an unfavorable position when it comes time to submit their insurer's claims data for risk adjustment.

The HHS-HCC Risk Adjustment Model

The Department of Health and Human Services Hierarchical Condition Categories risk adjustment model (abbreviated HHS-HCC) is used in the ACA's risk adjustment provision to evaluate the plan liability risk scores for insurers in the individual and small group markets. A risk adjustment model (merely one factor in the risk adjustment transfer payment formula discussed above) "uses an individual's demographics and diagnoses to determine a risk score, which is a relative measure of how costly that individual is anticipated to be" (Kautter).

The CMS-HCC risk adjustment model (which has been used in the past for risk adjusting Medicare Advantage plans) was the basis for the HHS-HCC risk adjustment model. Changes were then made to reflect the different conditions existing in the individual and small group markets post-ACA versus the Medicare Advantage market. Notably, since Medicare populations were used in developing the CMS-HCC model, adjustments needed to be made to reflect a demographic consisting of more than seniors and disabled individuals. Additionally, the sample size for certain diagnoses (i.e. pregnancy or neonatal complications) in the Medicare population are quite low when compared with the commercially insured population. A final change relates to the type of medical spending that is reflected in the risk score. The CMS hierarchical condition

categories “are configured to predict non-drug medical spending” while the HHS-HCCs “are configured to predict the sum of medical and drug spending” (Kautter).

This leads into one of the greatest challenges associated with risk adjustment models. According to Milliman, “perfect risk adjustment” would result in a market where “insurance carriers would theoretically be indifferent to “risk” associated with the members they enroll” (Leida, Katterman). In order for the risk adjustment program to be successful, the risk adjustment mechanism must be able to accurately reflect cost differences associated with different demographics and risk scores. It must simultaneously protect insurers with high-risk enrollees and reduce financial incentives for insurers trying to target a particular demographic with lower associated claims costs. The resulting challenge for risk adjusters is creating a model that can predict current medical claims costs. However, as a result of constant changes occurring in the healthcare field due to factors such as fluctuations in the price of prescription drugs, the creation of new prescription drugs, advances in medical technology, and others, the model needs to be frequently reevaluated.

Another concern for insurers and their actuaries relates to the importance of coding. Because risk scores are based on the diagnosis codes for an enrollee in the given year, “timely coding and processing of claims is important to ensure that all conditions are flagged by April of the following calendar year” (Van der Heijde, Paulus). In order to maximize profits/minimize losses from risk adjustment, accurate and detailed coding is essential, and could make a considerable difference when the government calculates the risk adjustment transfer payments. Therefore, differences in the

thoroughness and precision of coding from one insurer to the next can have profound impacts on the risk adjustment transfer payments.

Risk Corridors

The third component of the 3 R's is risk corridors, and applies to individual and small group qualified health plans from 2014-2016. The specific goal of the risk corridors provision is to protect health insurers against the "pricing uncertainty of their plans" in the post-ACA marketplace by "temporarily dampening gains and losses in a risk-sharing arrangement between issuers and the federal government." Risk corridor payments are calculated by comparing "allowable costs" to a "target amount." Allowable costs consist of claims costs plus certain adjustments including reinsurance, risk adjustment, and health information technology costs. The target amount consists of premiums minus allowable administrative costs. The allowable administrative (non-claim) costs do allow a certain margin for profit. The ratio of allowable costs to target costs dictates whether the insurer will owe or be owed a risk corridor payment. The table below (Table 4) illustrates how the fee or reimbursement is calculated, where x is equal to the allowable costs over the target costs (Norris, Van der Heijde, Leida).

Table 4

Risk Corridor Calculations

Allowable Costs/Target Costs	Result
0.92>x	80% Fee
0.92<x<0.97	50% Fee
0.97<x<1	No Fee
1<x<1.03	No Reimbursement
1.03<x<1.08	50% Reimbursement
x>1.08	80% Reimbursement

Source: Norris, Doug, Mary van der Heijde, and Hans Leida. “Risk Corridors Under the Affordable Care Act.” *SOA Health Watch* 73 (2013): 5–10. Print.

When interpreting the above table, note that if the ratio of allowable costs to target costs is greater than one, the premium collected was less than required, and if the ratio is less than one, then the premium collected was more than required. The above table results in three potential situations. If a given plan’s ratio of allowable costs over target costs is within 1±0.03, the plan does not pay any fees or receive any reimbursement. For the next five percentage points (i.e. 0.92-0.97 or 1.03-1.08), the gains or losses are split 50/50 between the insurer and the government. Lastly, for any gains or losses beyond those points (i.e. <0.92 or >1.08), the plan keeps either 20% of the gains or is reimbursed 80% of the losses.

Ignoring for a moment the complexity inherent in the risk corridors formula, there exist other considerations for actuaries and insurers regarding this provision. As illustrated above, the risk corridors program is symmetric and two-sided. Originally, this provision of the ACA was not required to be budget neutral, meaning that risk corridor payments did not have to equal risk corridor reimbursements. In late 2014, the passing

of the Cromnibus bill required that “2014 risk corridor receivables paid in 2015 be funded through payables into the program from other insurers.” An announcement from the CMS on October 1st of 2015 revealed what “many industry analysts foresaw”: severe underfunding of the program. Insurers can now expect to receive a mere 12.6% of their 2014 risk corridor receivables in 2015. This leads to concerns regarding potential 2015 and 2016 receivables because those insurers that were underfunded for 2014 will be first in line to collect payments in later years (assuming the funds are available) (Katterman).

Before leaving the subject of risk corridors, it is important to consider what caused this funding shortfall. Milliman actuary Scott Katterman proposes a number of potential causes in his article titled “Headwinds cause 2014 risk corridor funding shortfall.” The most notable of these proposed causes relates to the reality that the health insurance market favors plans in a risk corridors receivables position. Katterman states that, “all else being equal, lower-priced plans are more likely to be in a risk corridor receivables position while higher-priced plans are more likely to be in a payables position.” Assuming equivalent benefits, lower-priced plans generally result in greater enrollment when compared to higher-priced plans. Therefore, the market will have a higher concentration of enrollment in the lower-priced plans when compared with higher-priced plans, and these lower-priced plans are more likely to be in a receivables position because of the lower premiums. Additionally, had it not been for the changes to reinsurance for 2014 (decreased attachment point and increased coinsurance rate), the risk corridors program would have been in an even less favorable position (Katterman).

Conclusion of ACA Changes

Healthcare consumers have immediately felt the impacts of specific aspects of the ACA including guaranteed issue, the family 3-child cap, and the creation of the health insurance marketplace. Meanwhile, the new legislation has necessitated many changes in regards to actuaries' work in the health insurance industry. Actuaries have been further incentivized to perform market analyses in order to best manage the risks of their employers in 2014 and beyond, and must consider a variety of new factors in addition to the risk profiles of their target demographic. It has also been demonstrated how this new legislation has imposed restrictions on how actuaries can price their plans. The above topics will be considered heavily when performing the following analysis regarding the changes necessitated by the post-ACA marketplace.

Rating Restrictions Analysis

The following pages will consist of a statistical analysis comparing changes in the relative pricing of health insurance premiums in 2013 versus 2014. The data for the following analysis was provided to me by the Washington State Office of the Insurance Commissioner (Washington State Office of the Insurance Commissioner Health Insurance Rate Filing Database). This government office is, among other things, responsible for reviewing all health insurance rate filings and ensuring that an insurer's rates are actuarially sound and work within the established legislation governing health insurance plans. The dataset is complete, meaning that my analysis was conducted using every premium from every insurer in Washington in 2013 and 2014. Note that the insurer Moda was formerly known as ODS. They are treated as the same company for the purpose of comparing data from 2013 and 2014. For the following tables, an "N/A" in

the 2013 column indicates the insurer was not a part of the Washington individual market in 2013. The “SD” column will present the corresponding standard deviation of the average ratio or factor. In total, rates were gathered from 14 different insurers with a sum of 92 plans in 2013 and 95 plans in 2014.

As detailed previously, 2014 brought about age-related pricing restrictions (known as age bands) and tobacco usage related rating restrictions. As a reminder, recall that the ACA age bands required that the ratio of health insurance premiums for children (defined as individuals aged 0-20) versus adults aged 21 is 0.635:1. The ACA also requires the ratio of health insurance premiums for individuals aged 64 and older versus individuals aged 21 to be 3:1. Finally, the ACA has required that the ratio of health insurance premiums for tobacco versus non-tobacco using individuals of the same age to be no greater than 1.5:1.

In order to quantify the significance of these restrictions, the health insurance premiums from 2013 and 2014 in the Washington individual market were compiled through the aforementioned source. After compiling and organizing the rates, the following three statistics were calculated and reformatted as tables: the average ratio of premiums for children versus individuals aged 21 in 2013 and 2014 (Table 5), the average ratio of premiums for individuals aged 64 and older versus individuals aged 21 in 2013 and 2014 (Table 6), and the average tobacco rating factor for 2013 and 2014 (Table 7).

Table 5

Average ratio of premiums for children versus individuals aged 21

	Number of Plans		2013		2014	
Insurer	2013	2014	Average Ratio	SD	Average Ratio	SD
Asuris	13	6	1.000	0.000	0.635	0.000
BridgeSpan	N/A	3	N/A	N/A	0.635	0.000
Community Health Plan of Washington	N/A	3	N/A	N/A	0.635	0.000
Coordinated Care Washington	N/A	3	N/A	N/A	0.635	0.000
Group Health Cooperative	8	7	0.766	0.093	0.635	0.000
Group Health Options, Inc.	8	3	0.741	0.094	0.635	0.000
Kaiser Foundation Healthplan of the NW	20	13	1.000	0.000	0.635	0.000
LifeWise Health Plan of WA	6	15	0.836	0.015	0.635	0.000
Moda Health Plan, Inc. (formerly ODS)	14	2	0.833	0.007	0.635	0.000
Molina Healthcare of Washington, Inc.	N/A	2	N/A	N/A	0.635	0.000
Premera Blue Cross	1	23	0.757	0.000	0.635	0.000
Regence Blue Cross Blue Shield of Oregon	9	6	1.000	0.000	0.635	0.000
Regence Blue Shield	13	6	1.000	0.000	0.635	0.000
Time Insurance Company	N/A	3	N/A	N/A	0.635	0.000

The above table (Table 5) serves to compare the average ratio of premiums for children versus individuals aged 21 in 2013 versus 2014. The 2013 values were calculated using a two-step process. Firstly, the premium for children was divided by the premium for adults aged 21 for each individual plan in an insurer's portfolio. Then, these ratios were summed and divided by the total of number of plans offered by the given insurer. The identical 2014 ratios are a result of the government-mandated age bands. Also, we see high standard deviations for the 2013 plans offered by both Group Health Cooperative and Group Health Options. In looking at the data in more detail, both insurers offered two plans with low out-of-pocket maximums that generated ratios which did not align with the rest of their plans. Both insurers have similarly high standard deviations for the 2013 statistics in the below tables as well. Moving on, we see that no insurer in 2013 had a ratio even within 0.1 of the required ratio in 2014. In fact, four of the ten insurers that participated in the 2013 individual market offered the exact same rate to children and adults aged 21. This indicates that in the 2014 Washington

individual market, the health insurance premiums for children have decreased relative to the premiums for adults aged 21.

Table 6

Average ratio of premiums for individuals aged 64 and older versus 21

2013					
		Non-Smoker		Smoker	
Insurer	Number of Plans	Average Ratio	SD	Average Ratio	SD
Asuris	13	3.666	0.011	3.668	0.008
BridgeSpan	N/A	N/A	N/A	N/A	N/A
Community Health Plan of Washington	N/A	N/A	N/A	N/A	N/A
Coordinated Care Washington	N/A	N/A	N/A	N/A	N/A
Group Health Cooperative	8	3.339	0.391	3.341	0.398
Group Health Options, Inc.	8	3.326	0.384	3.334	0.393
Kaiser Foundation Healthplan of the NW	20	3.745	0.005	3.746	0.004
LifeWise Health Plan of WA	6	3.732	0.030	3.711	0.019
Moda Health Plan, Inc. (formerly ODS)	14	3.722	0.022	3.716	0.022
Molina Healthcare of Washington, Inc.	N/A	N/A	N/A	N/A	N/A
Premera Blue Cross	1	3.440	0.000	3.446	0.000
Regence Blue Cross Blue Shield of Oregon	9	3.672	0.007	3.663	0.007
Regence Blue Shield	13	3.669	0.009	3.669	0.012
Time Insurance Company	N/A	N/A	N/A	N/A	N/A
2014					
		Non-Smoker		Smoker	
Insurer	Number of Plans	Average Ratio	SD	Average Ratio	SD
Asuris	6	3.000	0.000	3.000	0.000
BridgeSpan	3	3.000	0.000	3.000	0.000
Community Health Plan of Washington	3	3.000	0.000	3.000	0.000
Coordinated Care Washington	3	3.000	0.000	3.000	0.000
Group Health Cooperative	7	3.000	0.000	3.000	0.000
Group Health Options, Inc.	3	3.000	0.000	3.000	0.000
Kaiser Foundation Healthplan of the NW	13	3.000	0.000	3.000	0.000
LifeWise Health Plan of WA	15	3.000	0.000	3.000	0.000
Moda Health Plan, Inc. (formerly ODS)	2	3.000	0.000	3.000	0.000
Molina Healthcare of Washington, Inc.	2	3.000	0.000	3.000	0.000
Premera Blue Cross	23	3.000	0.000	3.000	0.000
Regence Blue Cross Blue Shield of Oregon	6	3.000	0.000	3.000	0.000
Regence Blue Shield	6	3.000	0.000	3.000	0.000
Time Insurance Company	3	3.000	0.000	3.000	0.000

The above table (Table 6) serves to compare the average ratio of premiums for individuals aged 64 and older versus individuals aged 21 in 2013 and 2014. This calculation was performed by the exact same method as described above, except in this case the premium for individuals aged 64 and older was divided by the premium for

individuals aged 21. We again can note a change in this comparison where every single insurer in the Washington 2013 individual market was required to make significant changes to their pricing of insurance premiums in 2014. We see ratios in 2013 as low as 3.326 and as high as 3.746. This indicates that in 2014 health insurance premiums for individuals aged 64 and older were less costly relative to premiums for individuals aged 21 than in the previous year. The above two tables could be collectively interpreted to illustrate how a greater proportion of health insurance premiums has fallen on individuals aged 21 than in years past. Both the oldest and youngest enrollees have seen their premiums decrease relative to individuals aged 21. This could be good news for both enrollees with children and older individuals, while individuals aged 21-24 (who occupy identical age bands with a factor of 1) have seen their premiums increase relative to other demographics. From an actuary's perspective, this is certainly limiting as it is possible (if not likely) that given the previous year's ratios, the age bands have created a situation in which the relative premiums are not reflective of the actual change in costs associated with different ages.

Table 7

Average Tobacco Rating Factor

	Number of Plans		2013		2014	
Insurer	2013	2014	Average Factor	SD	Average Factor	SD
Asuris	13	6	1.147	0.022	1.150	0.000
BridgeSpan	N/A	3	N/A	N/A	1.150	0.000
Community Health Plan of Washington	N/A	3	N/A	N/A	1.000	0.000
Coordinated Care Washington	N/A	3	N/A	N/A	1.000	0.000
Group Health Cooperative	8	7	1.193	0.031	1.200	0.000
Group Health Options, Inc.	8	3	1.194	0.031	1.200	0.000
Kaiser Foundation Healthplan of the NW	20	13	1.208	0.010	1.200	0.000
LifeWise Health Plan of WA	6	15	1.162	0.027	1.075	0.000
Moda Health Plan, Inc. (formerly ODS)	14	2	1.162	0.024	1.000	0.000
Molina Healthcare of Washington, Inc.	N/A	2	N/A	N/A	1.000	0.000
Premera Blue Cross	1	23	1.158	0.024	1.075	0.000
Regence Blue Cross Blue Shield of Oregon	9	6	1.147	0.022	1.150	0.000
Regence Blue Shield	13	6	1.147	0.022	1.150	0.000
Time Insurance Company	N/A	3	N/A	N/A	1.200	0.000

Lastly, we come to the table comparing the average smoking factor in 2013 versus 2014 (Table 7). This calculation was a two-step process. Firstly, the premium for a tobacco user was divided by the premium for a non-tobacco user for every age of every plan in an insurer's portfolio. Then the average of these ratios was computed. Effectively, this means the average consisted of 45 ratios multiplied by the number of plans offered by the insurer. For example, LifeWise offered six plans in 2013, so the number of ratios used in calculating the average was 6*45, or 270. This 45 comes from adding the one age band spanning years 0-20, 43 separate age bands for individuals aged 21-63, and the final age band for individuals 64 and older.

Recall that the ACA implemented a cap of 1.5 for this tobacco user rating factor. The above table indicates that in Washington no insurer was anywhere near reaching that limitation, and with the exception of Moda, insurers did not change their tobacco rating factor by more than 0.01. As a purely speculative observation, it is possible that Moda and the three other insurers with a 1.0 tobacco rating factor have attempted to strategically target the population of tobacco users by making it such that their rates for tobacco users and non-tobacco users are the same. The ultimate conclusion from this table is that in the Washington individual market, the tobacco rating restriction has had no limiting effect on health insurance pricing.

Conclusion of Analysis

The above tables quantitatively demonstrate how the Affordable Care Act altered the actuarial pricing of medical insurance in the Washington individual market. The age bands were particularly restrictive, forcing every single insurer to make significant changes to their relative premiums. It was noted how these restrictions have effectively

placed a greater burden on individuals aged 21 versus children and seniors. This is particularly enlightening, as this design reflects the intent of the healthcare reform. In the past, actuaries primarily focused on pricing to the risks associated with their current and target demographics, but now these age-related rating restrictions have necessitated a redistribution of the burden of the costs of healthcare. On the other hand, there is little to no evidence that the tobacco rating restriction had any meaningful effect on the 2014 Washington individual market.

Final Thoughts

The purpose of this thesis was twofold. Firstly, the key provisions of the Patient Protection and Affordable Care Act were examined in order to better understand how the pricing considerations of health actuaries and the consumers of healthcare were affected. These changes specifically included guaranteed issue, the family 3-child cap for individual market rating, the health insurance marketplace, actuarial value, essential health benefits, age bands and tobacco usage, reinsurance, risk adjustment, and risk corridors. It has been illustrated how both individually and together these changes have significant implications for actuaries working to price health insurance in the individual and small group markets.

Secondly, a statistical analysis was conducted in an effort to quantify the significance of specific age and tobacco related rating restrictions in the Washington individual market. It was found that the age bands were the most significant restrictor, while the tobacco rating restriction had no discernible impact on rating. Furthermore, the data demonstrated the intent behind the design of the healthcare reform, and the effective redistribution of costs on young adults.

Unquestionably, there exists a great number of questions related to healthcare reform that are yet to be answered, and countless statistical analyses are currently being performed by actuaries to quantify the risks associated with these changes. Certain demographics will undeniably benefit from this recent healthcare reform, particularly those who were denied coverage because of preexisting conditions. Insurers and actuaries have, in turn, seen the complexity of their work dramatically increase. Profit margins will be further restricted by risk adjustment and risk corridors, and the number of pricing considerations for their actuaries has significantly increased. Only time will tell the stability and sustainability of this new system, but without question, the demand for health actuaries has increased, and their roles have become increasingly complicated.

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